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Part I

1. Introduction

1.1. Context

In 2007, the government of Ecuador initiated a process of standardization for all levels of education. This process involved the unification of curriculum and the creation of new educational facilities, which brought great improvement to the education. However, at the same time, this process of standardization gave rise to great challenges that need to be properly addressed. One of the problems that have arisen is that in this process of improvement of educational institutions, various small community schools attended by the indigenous communities of Ecuador were demolished to give place to the construction of ‘Escuelas del milenio’ (millennium schools). ‘Escuelas del milenio’ are a kind of generic technology-based infrastructure models of schools, where, for example, the traditional whiteboard is replaced by a digital version; hence, for the delivery of the lessons in these schools, teachers need to have a good technological knowledge (TK) (Mishra, & Koehler, 2006). These types of schools have been brought under the standardized models of education that are used in big modern cities of Ecuador. However, the teachers of the small indigenous towns do not understand the correct use of the technological aspects of the ‘new millennium classrooms’, and furthermore, in many cases, they do not receive the adequate support and training from the government due to economic factors. In addition, the government has created an annual standardized system of evaluation in order to evaluate the teachers’ knowledge and skills with regard to the new model of schools and education; if they fail to demonstrate adequate competence, they may lose their place of work. Therefore, teachers in small indigenous towns feel that they have been neglected by the government, as they do not fully understand how and from where they can get information to gain the necessary skills to cope with the new technological demands of these schools. Thus, they have lost interest in their teaching practices, which is detrimental for the pupils.

1.2. Problem exploration

It has been possible to determine that the teachers of the ‘Escuelas del milenio’ need an adequate understanding of the technological aspects in order to develop the skills that allow to effectively integrate technology in their teaching practices. Hence, this paper explores the need of information and digital literacy (IL) for teachers who teach in the Andean region of Ecuador. Thus, it has been decided to use the six frames for IL in order to create activities that will

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properly address the presented problems (Bruce et al., 2006). Additionally, the ‘Professional Learning Communities of Practice’ will be used as an approach to reinforce and sustain continuous professional development by mutual collaboration (Vescio et al., 2008).

1.3. Target group of learners

After a deep exploration of the presented problem, it was determined that the teaching and learning activities will be focused on the teachers that work in the ‘Escuelas del milenio’ and that they will be the target learners. In order to motivate the learners and create sustainable development of the learners’ knowledge and skills, the teaching and learning activities will be presented to the learners under the name of a professional development project called ‘Infodigitalizate’, which is based on ‘Professional Learning Communities of Practice’ (Vescio et al., 2008). This will allow the present project to perhaps expand into similar contexts across Ecuador or even better, across Latin America.

The learners would be middle-aged Ecuadorians teachers of schools from indigenous race backgrounds and who live in the Andean region of Ecuador. It has been acknowledged that these learners have their own languages and traditions, typical of their indigenous roots; hence, the learners’ mother language in some cases is ‘Quechua’. However, as the official language of Ecuador is Spanish, all the learners have adopted this language as their main form of communication. In terms of computer and internet access, we can assume that most of the learners have a reasonable understanding in how to use computers and internet; as school teachers, they have been previously trained in basic computer skills by the government. Additionally, most of these learners have continuous access to internet at their place of work; also, there is a wide range of cyber cafes in the town that most of the teachers use when they do not have access to computers and internet at home.

1.4. Identification of the teacher’s needs

It has been identified that the technological focus of ‘Escuelas del milenio’ has created a need for the teachers of Ecuador to improve their IL in order to cope with the demands of this new type of schools, since the quality of education that the children will receive in these schools will depend on this.

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Therefore, The Association of College and Research Libraries and the Educational and Behavioural Sciences Section (EBSS) Instruction for Educators Committee (ACRL online 2011) have presented the following literacy standards for teachers:

1. Should define and articulate the need for information and select strategies and tools to find that information.
2. Should locate and select information based on its appropriateness to the specific information need and the developmental needs of the student.
3. Should organize and analyse the information in the context of the specific information needs and the developmental appropriateness for the audience.
4. Should synthesize, process, and present the information in a way that is appropriate for the purpose for which the information is required.
5. Should evaluate discrete pieces of information as well as the entire information seeking process.
6. Should know how to ethically use and disseminate information.

Hence, taking in mind the presented standards of literacy, the following deficiencies in the teachers' digital skills have been identified:

1. The need for teachers to reflect on their teaching practices in order to define which information they require to be able to successfully incorporate technological tools within the content of their lessons.
2. The ability to locate relevant sources of information, such as textbooks, online journals, blogs, wikis, and newsfeeds among others, in order to select them and responsibly incorporate them in their teaching practices.
3. The ability to find the appropriate information regarding how to utilize, organize, and manage their teaching resources, for instance by the use of cloud storage services.
4. The capacity to critically evaluate available educational online material in order to select and use it in classroom under the understanding of intellectual property and ethical issues.
5. The skills required to use technology to create their own teaching resources.

6. The skills required to locate and appropriately join a virtual community of practice in order to gain support and mutual collaboration.

Part II

2. Information Literacy Development

2.1. Digital literacy to address the teacher's needs

After the needs of the teachers from the 'Escuelas del milenio' in Ecuador have been identified, the next stage will be the creation of learning activities under the previously mentioned professional development project call 'Infodigitalizate'. Hence, after a critical review of the relevant literature, it has been decided that the learning activities will have a combination of the six frames of IL: content, competency, learning to learn, personal relevance, social impact, and relational frame (Bruce et al., 2006), as it is important to bear in mind that in order to have an effective IL plan, all these frames need to be incorporated (Whitworth, 2014). In addition, the value of the various models of digital literacy have been identified, such as the Hobb's model, which defines digital media literacy as skills that are vital to cope with the demands of the digital world. Another literacy model is Belshaw's model, in which the acquisition of digital competence is based on eight components: cultural, cognitive, constructive, communicative, confident, creative, critical, and civic (Savage & Barnett, 2015); hence, the learning activities involved in the lessons will have an integration of all the above-mentioned components. Additionally, in order to promote mutual support and sustainability of the project, the learning activities will be designed and supported by the principles of 'Communities of Practice' (Wenger et al., 2002).

2.1.1 Lesson plan A: Searching information on the internet

In this lesson, the teachers will be given a task to find solutions for an educational problem. They will have to find appropriate and relevant information from the internet to solve the problem. This activity will require mutual collaboration, as it will be done in groups of two. It is expected that at the end of this lesson, the teachers will be able to recognize their strengths and limitations when searching for information. The relational and personal relevance frame of IL (Bruce et al., 2006) will be the most prevalent educational approach in this lesson, as the main objective of this IL project is the development of critical thinking, which will allow the learners to always have

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something new to analyse and reflect upon (Whitworth, 2014). Additionally, in this lesson, the cognitive component of Belshaw's model has been taken into account by providing the teachers possibilities to reflect and incorporate a large number of solutions for the set problem into their own teaching contexts (Savage, & Barnett, 2015).

2.1.2 Lesson plan B: Organizing and managing teaching resources online

The second lesson is focused on helping the teachers build the ability to find the appropriate digital tools in order to understand how to utilize, organize, and manage teaching resources. This lesson has been designed under the content and competency frames (Bruce et al., 2006), which will help the learners develop skills that will allow them to effectively locate and understand the relevant online tools such as goggle docs, online storage sites, blogs, and wikis; these tools will help them collect and organize their teaching resources. In addition, in this lesson, the 'communicative factor' of Belshaw's model has been incorporated into the activities to promote the use of networking and online collaboration (Savage & Barnett, 2015).

2.1.3 Lesson plan C: Using internet safely and respectfully

The third lesson has been designed around the ethical and safety issues of the use of technology. Teachers will be given a task where they will have to search for information and then create their own presentation, by respecting the copyright of all the material used to support the presentation. Additionally, teachers will have to watch a video from YouTube, and they will have to decide whether it is suitable to be used in classroom and its impact on the society. The social impact frames (Bruce et al., 2006) acknowledge various issues regarding digital technology; hence, this aspect has been included into this lesson. Moreover, the 'critical component' of Belshaw's model has been included by promoting the creation of responsible users (Savage & Barnett, 2015).

2.1.4 Lesson plan D: Virtual communities of practice

The fourth lesson has been designed around the principles of communities of practice, thus a game has been decided to be used, which has been created with the help of 'Kahoot', an online free educational quiz creator, where teachers will take an online group test. Through the test, all the information provided in the previous lessons will be assessed. At the end, the first and second place winners will get a reward, which will be to become the directors of 'Creatividad', a collaborative project in which teachers will work together to produce original educational resources in the audio, video, or text format. The assignation of roles will be necessary, and

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teamwork will be promoted in this project. Hence, the principles of communities of practice will be reinforced, where the acquisition of knowledge will be meaningful for the teachers based on the fact that they share the same profession with the same objectives; this will also promote mutual engagement (Wenger, et al., 2002, p.229). As the last stage, teachers will have to ensure that all the members of their groups are connected in order to share the resources they have created, they will be advise to use 'Edmodo' , which is an educational technology program that helps connect teachers in a mutual collaborative online environment, where they can share teaching material, evaluations, etc. (Edmodo, 2016). In this lesson, the learning to learn content frame has been incorporated in order to provide the teachers with the opportunity to reflect on the knowledge gained and incorporate it into a specific task to produce something (Bruce et al., 2006). The 'confident and creative factors' have been included in the activities, as all the teachers need to develop a sense of what they have learnt in relation to the procedures and systems of digital technologies to create digital content (Savage & Barnett, 2015).

2.2. What benefits does COP bring to the information literacy of the target audience?

The communities of practice are based on the following characteristics: the domain, which is where the mutual interests are shared, and the community, where members with the same interest gather together to build their knowledge base further and practice can occur with the daily interaction of the members at work; for instance, with a simple conversation in relation to their practices, the members can enrich each other's knowledge and information base. Hence, the combination of these three factors represents the community of practice (Wenger, et al. 2002). Therefore, it has been decided to use the community of practice as an approach to keep a digital literacy development project sustainable, where the members of the community can interact and work with each other to gain information and digital literacy competence.

On the other hand, it was identified that the Ecuadorian teachers from the capital and the big cities did not have major issues gaining digital literacy skills in order to cope with the new technological demands of 'Escuelas del milenio'; due to differences in social, economic, and cultural aspects. Hence, 'Infodigitalizate' literacy project will promote the development of virtual communities of practice, where the teachers from big cities will get in contact with the teachers from small indigenous towns, and experiences and knowledge will be expected to be shared. This specific aspect will be promoted in the last lesson by the use of 'Edmodo' or similar online educational platform.

Part III

3. Teaching and learning activities

3.1 Context and criteria

The activities will be delivered through the following WordPress blog created for this specific context – <https://educ61711.wordpress.com/> – which will host all the materials related to the lessons along with the activities previously mentioned in this paper in an online and printable format. Additionally, learners will have access to all the materials, and to maintain mutual collaboration, they will have access to a discussion board where they will be able to post their suggestions and ideas. This project is expected to have people working together; hence, it will be suggested that the schools offer a physical space for these activities to take place.

After analysing various factors surrounding the needs of the teachers, it has been decided to design and deliver the activities under the following criteria:

- A. provide the teachers (learners) with a better understanding of the use of information and literacy in collaborative learning environments;
- B. motivate the teachers to continue with innovation practices;
- C. be interactive and easy to understand within an appropriate time to complete; and
- D. provide with information that can be utilized and spread within the communities of practice.

3.2 Lesson plan A

Topic: Searching information on the internet

Aims and objectives:

- To help students locate and select information from the internet
- To develop student's comprehension of the use of internet as an information resource
- To develop student's problem-solving skills
- To help students identify their strengths and weaknesses in searching information

Time required: 50 minutes

Equipment and material:

1. Computer/tablet with internet access
2. YouTube video (previously selected for learning purposes)

Introduction: In this lesson, students will watch a video on YouTube, where they will observe a problem of classroom behaviour management. To find the solutions for the problem, they will have to search for relevant sources of information with the help of the internet.

Preparation and development:

Part 1 (about 10 minutes): Instructions for the activity are provided at the beginning of the lesson. Then in small groups of two people, the students open a link to access the video and watch it while taking notes to identify the classroom behaviour problems.

Part 2 (about 20 minutes): The students, with the help of the internet, individually search for information to find possible solutions for the presented problem. On finding the solutions, the students compare their answers with a partner. Then, together they have to self-reflect on their own teaching practices and find similarities with the problem presented in the video and how the solutions found can be incorporated in their own classroom.

Part 3 (about 20 minutes): In this part of the activity, the students need to find relevant information in order to propose solutions for classroom behaviour management with the use of technology. They are asked to find at least two digital educational resources that would help them engage their pupils in the classroom.

Assessment: The students take a short quiz of five questions to assess their understanding of the use of the internet when searching for information.

Optional follow-up task:

With the help of the internet, the students identify the major problems they face as teachers in 'Escuelas del milenio' and try to find the possible solutions. This task must be carried out in small groups of up to four people.

3.3 Lesson plan B

Topic: Using internet safely and respectfully

Aims and objectives:

- To develop student's comprehension of the internet safety issues
- To develop student's understanding of the ethical issues concerned with the use of information
- To help students utilize and promote the use of internet responsibly
- To develop the ability to assess the reliability of digital sources

Time required: 45 minutes

Equipment and material:

1. Computer/tablet with internet access

Introduction: In this lesson, the students will search for information in relation to online safety for children and create a presentation and reflect on the importance of responsible use of digital sources.

Preparation and development:

Part 1 (about 20 minutes): The students are divided in pairs; the task is to find relevant and reliable information with the help of the internet in relation to online safety for children. They have to create a small presentation for the audience.

Part 2 (about 15 minutes): In this stage, all the students are organised in small groups of four and discuss and formulate their own opinions on internet safety for children. They have to identify why it is important to educate children on the appropriate use of the internet.

Part 3 (about 10 minutes): In this part of the activity, the students have to watch a YouTube video and decide whether the video is suitable for children and how its use could affect the social environment.

Assessment: The students take a short quiz of five questions to assess their understanding of the internet security and ethical issues.

Optional follow-up task:

The students need to come up with ideas on how internet safety policies can be successfully implemented in 'Escuelas del milenio' for teachers, parents, and children.

3.4 Lesson plan C

Topic: Organizing and managing teaching resources online

Aims and objectives:

- To help students organize their professional and personal files
- To help students identify and effectively use online storage systems
- To develop students' networking and mutual collaboration skills

Time required: 60 minutes

Equipment and material:

1. Computer/tablet with internet access
2. YouTube video (previously selected for learning purposes)

Introduction: In this lesson, students will watch a YouTube video, through which they will observe a real example of why understanding the use of online storage is important at a professional and personal level. Then, the students, with the knowledge and skills acquired from the previous lesson, will search for information about online storage providers and also about different ways to organize and manage files with the help of technology.

Preparation and development:

Part 1 (about 10 minutes): Instructions for the activity are provided at the beginning of the lesson. Then, in small groups of four, the students open a link to access the YouTube video and watch it while taking notes to identify the benefits and disadvantages of using cloud storage systems.

Part 2 (about 30 minutes): In their groups, the students discuss how cloud storage systems can help them in their professional and personal life. They have to reach a mutual agreement on the challenges and potentials of its use. Afterwards, with the help of the internet, they have to search for the most suitable and accessible cloud storage service for them. (Guidance is provided if required in relation to the available storage providers such as Google or Microsoft.)

Part 3 (about 20 minutes): In this part of the activity, the students are divided in small groups of two and are given a task to choose the cloud storage providers they want to use based on the information they have found. Then, they select the teaching materials they would like to put online and decide on how they can make them available for their students or other teachers within the same areas.

Assessment: The students have to put at least two files in one of the cloud storage services that they have decided to use.

Optional follow-up task: The students explore more options in relation to online storage services such as blogs.

3.5 Lesson plan D

Topic: Virtual Communities of Practice**Aims and objectives:**

- To help students locate and join virtual communities
- To develop students' skills on teamwork and collaboration
- To promote students' creativity and innovation

Time required: 80 minutes

Equipment and material:

1. Computer and tablets or smartphones with internet access
2. Kahoot online game (previously designed for learning purposes)

Introduction: In this lesson, the students will take a group quiz with the help of 'Kahoot'. Through the quiz, their level of understanding of the information presented in all the previous lessons will be assessed. Additionally, the students will create and share their own digital teaching material.

Preparation and development:

Part 1 (about 20 minutes): Instructions for the activity are provided at the beginning of the lesson, and then the students take the quiz in a form of a game created with the help of Kahoot. Then, the first and second place winners of the quiz are selected to be the directors of 'Creatividad'.

Part 2 (about 45 minutes): The students need to be assigned roles in order to become a part of 'Creatividad', a project that involves the creation of at least two digital teaching resources in the audio, video, or text format. In addition, the students have to gain access to 'Edmodo' and connect all the members of the group. (Guidance is provided if required in relation to Edmodo technicalities)

Part 3 (about 15 minutes): In this part of the activity, the students are expected to appropriately share the digital materials they have created with all the members of the group by using 'Edmodo'; the possibility to use other similar platforms will be left open.

Assessment: The students need to show their ability to use virtual communities by connecting with other teachers from different parts of the country.

Optional follow-up task: The students will be encouraged to explore more options in relation to networking and social media, such as the use of Facebook, twitter, etc.

4. Conclusions

It has been demonstrated that it is vital for individuals to possess the appropriate skills and knowledge in order to cope with new technological innovations. Therefore, I would like to see that the knowledge that will be acquired by the teachers in the presented lessons is spread to other members of the society in order to enrich and empower their information base, which will allow them to progress as members of the Ecuadorian society.

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Appendix 1

Figure 1: Type of schools and classroom before the ‘Escuelas del milenio’



Figure 2: The new millennium schools since 2008



Figure 1: The new model of classrooms

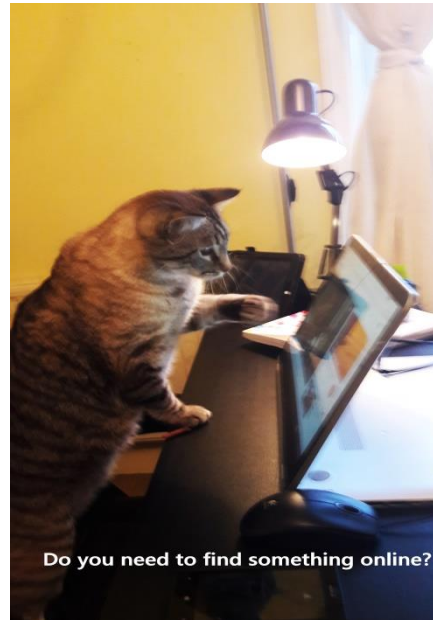


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Appendix 2

<https://educ61711.wordpress.com/>

It has been decided to use friendly characters (Cats) to promote the use of communities of practice in order to attract people to the “Infodigitalizate” digital literacy project.



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WELCOME ABOUT LESSON 1: SEARCHING INFORMATION LESSON 2: ONLINE SAFETY LESSON 3: ONLINE STORAGE SYSTEMS LESSON 4: VIRTUAL COMMUNITIES

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WELCOME

Welcome to Infodigitalizate

Communities of Practice - Innovative Learning

What will we cover?

Lesson A: Searching information on the internet

Lesson B: Using internet safely and respectfully

Lesson C: Organising and managing teaching resources online

Lesson D: Virtual Communities of practice

Infodigitalizate

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MENU

Welcome

About

Lesson 1: Searching Information

Lesson 2: Online Safety

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